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SDSU Cow/Calf Teaching and Research Unit

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SUMMARY

The SDSU Cow/Calf Unit (CCU) is a multi-purpose facility that provides resources for Animal Science courses and research projects. Cattle produced at the facility are also utilized by Little International, Block and Bridle, and livestock judging teams. The facility is managed by Kevin Vander Wal and generally employs 4 to 5 undergraduate students.

BREEDING PROGRAM

Although the CCU has a multi-purpose mission, the breeding program is primarily centered on the production of bulls and females that can be used for teaching purposes and sold to the general public. Artificial insemination is used extensively. The program primarily utilizes proven sires; however, each year a percentage of the females are bred to younger sires with lower accuracy expected progeny differences (EPDs). The objective of the breeding program is to produce docile cattle with excellent calving ease, growth, and carcass characteristics. Average expected progeny differences of the cows, heifers, and AI sires used in 2014 are included in Tables 1 and 2.

Table 1. Average expected progeny differences of Angus cows, heifers, and AI sires used in 2014.

	Expected progeny differences[a]									Value Indexes[b]	
	CED	BW	WW	YW	SC	Milk	Marb	REA	Doc	$W	$B
Cows	7.2	1.6	51.6	92.4	0.90	27.7	0.48	0.58	12.6	37.19	79.52
Heifers	6.8	1.8	56.9	99.9	0.93	28.5	0.50	0.71	12.9	36.36	86.92
AI sires	11.0	0.5	63.6	114.8	1.27	34.8	0.99	1.09	25.6	51.40	108.20

[a]CED = calving ease direct; BW = birth weight; WW = weaning weight; YW = yearling weight; SC = scrotal circumference; Milk = maternal milk; Marb = marbling score; REA = ribeye area; Doc = docility

[b]$W = wean value; $B = beef value

[1] The authors would like to acknowledge Zoetis Animal Health for product donations (Eazi-Breed CIDRs, Lutalyse, and Factrel) toward the synchronization research projects, and Western Point, Inc., Apple Valley, MN for the donation of EstroTect patches. Salaries and research support were also provided by state and federal funds appropriated to South Dakota State University.

Table 2. Average expected progeny differences of SimAngus™ cows, heifers, and AI sires used in 2014.

	Expected progeny differences[a]								Indexes[b]	
	CE	**BW**	**WW**	**YW**	**MLK**	**Marb**	**REA**	**Doc**	**API**	**TI**
Cows	15.3	-1.6	56.4	90.0	26.4	0.50	0.73	11.3	146.5	72.4
Heifers	15.6	-1.6	60.9	97.3	28.7	0.47	0.90	11.8	150.7	76.9
AI Sires	13.2	-0.5	71.6	113.4	29.0	0.54	0.95	14.7	151.9	83.7

[a]CE = calving ease; BW = birth weight; WW = weaning weight; YW = yearling weight; MLK = milk; Marb = marbling score; REA = ribeye area

[b]API = all-purpose index; TI = terminal index

REPRODUCTIVE PERFORMANCE

In 2014, the cowherd was utilized in a reproductive experiment. The standard 7-d CO-synch + CIDR program was applied to all cows. Estrotect patches were applied at time of CIDR removal. At 60 hours after CIDR removal, patches were read and animals were placed into four groups (Table 3).

Table 3. Experimental design beginning 60 h after CIDR insert removal and prostaglandin F_{2a} delivery.

		Time since CIDR removal, h	
Patch score[1] (estrus classification)	**Treatments**	**60**	**75**
Nearly or 100% activated - estrus	Estrus control (CON)	AI + GnRH	…
Anything less - nonestrus	Early GnRH and early AI (E-E)	AI + GnRH	…
Anything less - nonestrus	Early GnRH but delayed AI (E-D)	GnRH	AI
Anything less - nonestrus	Delayed GnRH and delayed AI (D-D)	…	AI + GnRH

[1]Patch scores (2 = fully, 1 = partly, or 0 = not activated per photos).

There were 102 cows on the study. Sixty cows had activated patches at 60 hours (CON) and an AI conception rate of 78% (47/60). Of the remaining 42 females, 14 were allotted to the each of the remaining treatments (E-E, E-D, and D-D). Conception rates for the E-E, E-D, and D-D groups were 71% (10/14), 50% (7/14), and 50% (7/14), respectively. Caution should be exercised when evaluating these data. Because of the small number of cows, the data have not been analyzed statistically and have been included in a larger, multi-state study that includes herds from KS, ND, CO, MS, MN, FL, and IL.

SALES

Each April, the SDSU Seedstock Merchandising class coordinates an annual bull sale at the CCU. The sale is designed to be a learning experience for the students and they are responsible for advertising, promotional videos, developing the sale catalog, and customer service. In 2014, the bull sale attracted customers from SD, IA, and MN. The sale included 16 Angus and 15 SimAngus™ yearling bulls. Results of the sale are presented in Table 4.

Table 4. Results from 2014 annual bull sale

	Lots	Average	Range
Angus bulls	16	$5087.50	$2800-$8600
SimAngus™ bulls	15	$4053.33	$3000-$5700
Overall bull average	31	$4587.10	
Angus sire groups			
Connealy Consensus 7229	1	$4166.67	
Connealy Final Solution	3	$6033.33	
Connealy Imprint 8317	1	$5500.00	
Hoover Dam	3	$3766.67	
KM Broken Bow 002	2	$7300.00	
S Chisum 6175	1	$5600.00	
SAV Pioneer 7301	1	$4500.00	
VAR Rocky 80029	2	$4650.00	
Simmental and SimAngus sire groups			
Gibbs 0689X Crimson Tide	3	$3433.33	
Hooks Shear Force 38K	2	$4400.00	
MR NLC Upgrade U8676	5	$4660.00	
S D S Graduate 006X	1	$3500.00	
TJ Sharper Image 809U	3	$3966.67	
TNT Finale W241	1	$3000.00	

NEW FACILITY

The current CCU was built in 1950 and, while it is a functional facility for managing a cowherd, it has significant limitations as a teaching and research facility. One of the components of the Land-Grant mission is teaching. Our objective is to provide our students with the best education possible and a large component of educational process is experiential learning (i.e., learning by doing). The current facility is not well equipped to provide a positive learning experience to students. A second component of the Land-Grant mission is research. Conducting research that answers production related questions and provides new technology to producers is essential to the long-term viability of the beef industry in South Dakota. Other than a small group of replicated pastures, the current CCU is not equipped to support research. The final component of the Land-Grant mission is Extension and outreach. Effective transfer of new knowledge and technology from the university to end users allows for the most current research findings to be adopted by the industry. The new facility will greatly enhance the ability of our faculty and staff to conduct informational meetings, trainings, and seminars to producers and industry professionals.

Final plans are in place for a new facility near campus to support the teaching, research, and Extension efforts in beef cattle production. The new facility will be equipped with Insentec individual feeding units that will allow for collection of individual feed intake and application of individual treatments to cattle within the same pen. The new facility will also have Insentec water units that will allow us to quantify water intake during different times of the year, during different stages of production, and with different types of diets. The water units will also be individually plumbed and equipped with dose meters that will allow for application of treatments via the water supply. This equipment will greatly enhance the ability of the facility to support numerous types of research in nutrition, genetics, reproduction, health, and other disciplines without having to expand the current cowherd. The facility will also be constructed to

facilitate biosecurity of the cattle fed there. We will be able to house both feedlot cattle and our own cattle in the facility at the same time. The facility will also enhance our ability to teach and conduct Extension and outreach activities. It will be equipped with a classroom and an indoor working facility to allow students and producers to be exposed to hands-on learning experiences throughout the year.

We continue to raise funds from both individuals and allied industry partners. Numerous families and corporate partners have made incredibly generous commitments to the project, but we still need more financial commitments before we can break ground on this facility. If you would like to receive more information on the new facility or if you are interested in contributing to the project, please contact Dr. Cody Wright (cody.wright@sdstate.edu; 605-688-5448) or Mike Barber at the SDSU foundation (mike.barber@sdsufoundation.org; 605-697-7475).